

forms in rivers, and is the term applied to ice formed on and attached to the bottom of rivers. This anchor-ice is only formed in rivers where the current is too swift for surface-ice to form, and not in depths exceeding 40 feet to 45 feet, though in the clear seawater off the coast of Newfoundland it is largely formed at depths of 60 feet to 70 feet. Its formation appears to be rightly attributed to loss of heat in the bed of the river from radiation, for it occurs on clear, cold nights, and is impeded by any form of shelter interfering with radiation, such as under a bridge; it does not form at all under surface-ice arresting radiation, and is less below a turbulent river than in a clear, still sea. Frazil-ice is the cause of the packing up of the ice and of the floods of the St. Lawrence, and also of the obstruction to the working of the power plants in the winter. When a river is completely frozen over, the channel is protected from the formation of frazil-ice or anchor-ice, unless there is an expanse of open water above, from which frazil-ice, and in mild weather anchor-ice, is carried down. To prevent the stoppage of the power works in the latter case, the author suggests that the gates, the rack for arresting debris, and the wheels should be placed under shelter; that the iron bars of the rack should be heated; and that the passage of the frazil-ice should be facilitated as much as possible, and prevented from agglomerating by the occasional injection of steam.

#### ROMANTIC INDIA.

*Under the Sun: Impressions of Indian Cities.* By P. Landon. Pp. xii+288; illustrated. (London: Hurst and Blackett, Ltd., 1906.) Price 12s. 6d. net.

THIS is one of the crop of books on India by Press correspondents who visited the great Eastern dependency during the recent tour of the Prince of Wales. Its author had previously on one or two occasions spent some weeks in the country, and now presents part of his already published letters "recast in a more permanent form." It is perhaps inevitable that the great bulk of the impressionist literature on the East should issue from the hurried pens of the cold-weather globe-trotters, whose "butterfly zigzags" over the country undoubtedly enable them often to see things from fresh and comparative, if somewhat superficial, standpoints. With all India to roam over, it would be surprising did the oft-told tale of Indian cities not bear some repetition at the hands of such an imaginative journalist as Mr. Landon. He certainly has produced a readable book, though many of his sketches convey less clear-cut impressions of the places than those of some other writers who have gone over the ground before, Steevens, for instance; and they lack proportion. Some point is seized on and overstrained with a discursiveness that causes the reader at times to lose the thread of the narrative, whilst other more characteristic features of the picture are omitted.

The author betrays a weakness for unnecessarily dragging in vernacular names (some of which are misspelt, e.g. "bebel," which occurs a dozen times

for "bābul," the *Acacia arabica*), with no word of explanation to the reader as to what the thing is, and his too frequent use of superlatives leads him into meeting the most transcendental thing "on earth" many times on his trip. Thus we are told within a hundred pages that at Udaipur "one room is without rival on earth." The Indian antelope and cheetah are "two of the fastest animals on earth—the cheetah is beyond all question the swiftest." Jaipur has "colours that only Mandalay of all places in the world can hope to rival." A "dishonest and fugitive jeweller from France" is "the first decorator of all known periods." The Delhi grand trunk-road is "the most historic highway in the East." Although the Taj is "the crown and goal of all that India has of beauty and romance," the Queen's monastery at Mandalay is "the most picturesque place in the East, probably in the world," though a few pages previously we read that the Shwe Dagon pagoda at Rangoon also is "the most picturesque place in all the East."

As to details, he is not over careful; he speaks of bread-fruit "palms," and of the reedy banks of Calcutta "flaming with patches of rose lotus"—this might be the case if lotuses grew on banks, but they do not. At Darjiling, he says, "the valley stretches out ten miles wide from the foot of the precipice"; as a fact, the valleys there are narrow ravines, none of which has a width of more than a quarter of a mile at its bottom. The photographs of the hackneyed views one has so often seen before are good and well reproduced; the same, however, cannot be said for the coloured prints, which are unpleasantly low-toned from a too liberal application of dull paint; the sombre view of "the sunset glories of the Hugli" is utterly unlike what it is meant to represent.

A chapter is added on the later life of the notorious rebel and fugitive of Mutiny days, Nana Sahib, purporting to give "historical facts here presented for the first time." No one, however, can seriously be expected to accept as evidence the old re-discovered bazaar rumours picked up by a passing traveller and set down without absolutely any proof whatever in support of them, all the more so as such an experienced Anglo-Indian magistrate as Sir Dennis Fitzpatrick, commanding the resources of the Imperial secret police, was specially deputed to sift such rumours at the time, and finally rejected them as wholly unfounded. There is no index, but this, perhaps, is unnecessary for fugitive sketches.

#### OUR BOOK SHELF.

*Species and Varieties: Their Origin by Mutation.* Lectures delivered at the University of California. Second Edition, Corrected and Revised. By H. De Vries; edited by D. T. MacDougal. Pp. xviii+847. (Chicago: Open Court Publishing Co.; London: Kegan Paul and Co., Ltd., 1906.)

It is not surprising that the first edition of De Vries's lectures in America should be followed by a second after the lapse of a year. All the misprints that we pointed out in our review of the first edition have been corrected; and even our suggestion that uniformity in the termination of the adjectives derived from such terms as physiology was

desirable has been adopted. But, curiously enough, the uniformity is intra-verbal and not inter-verbal; for whilst the physiologies and physiologicals of the first edition appear as physiologies in the second, and whilst the same course has been followed with the adjectival forms of morphology and palæontology, the empirics and empiricals of the first edition appear as empiricals in the second. We condemn the manner in which this uniformity has been introduced. We are perfectly aware that morphologic is correct, and that morphological is hybrid and redundant, containing as it does a Greek and a Latin adjectival termination, but we hold that the former is ugly and that the latter is not. If the customary termination is allowed in the case of empirical, on what grounds is it refused in that of physiological? If in our choice of the forms of terms we have to choose between those with the meaning and sound of which we have become familiar, be they never so hybrid, and those forms of them that we are told are strictly logic, let us by all means choose the former.

There is no need to commend the book. It is indispensable, inasmuch as it is the only available account of Prof. de Vries's work in English, so far.

A. D. D.

*Time and Clocks: a Description of Ancient and Modern Methods of Measuring Time.* By H. H. Cunynghame, C.B. Pp. 200. (London: Archibald Constable and Co., Ltd., 1906.) Price 6s. net.

IN this volume the author has gone much further than the title and subtitle would lead one to expect. Not only are the "ancient and modern methods of measuring time" discussed, but an attempt has been made to lead the non-scientific reader to a knowledge of the many principles involved in a series of logical steps. Mass, gravity, space, harmonic motion, &c., &c., are all discussed at length, whilst excursions into the ancient concepts of various phenomena are by no means infrequent.

We rather fear that the reader who has not gone through a course of dynamics will find it hard to grasp the significance of the various discussions, despite the clear reasoning and simple examples, whilst to the science student a greater part of the matter is unnecessary.

Still, in the hands of a youth trained in the ideal fashion suggested by the author at the end of the book (p. 186), the volume, carefully digested, should prove of service and tend "to keep the young rascal from worrying his sisters and stoning the cat."

W. E. R.

*Conduction of Electricity through Gases.* By Prof. J. J. Thomson, F.R.S. Second edition. Cambridge Physical Series. Pp. vi+678. (Cambridge: University Press, 1906.) Price 16s.

THIS book, the first edition of which was fully noticed in NATURE (vol. lxi., p. 74), will be welcomed by all those who are striving to keep up with the rapidly growing literature of an increasingly important subject. It was the author's researches in this field which first paved the way for the rapid extension of our knowledge which has taken place in the last few years. Much still remains to be done before the innumerable phenomena encountered in the study of the electrical behaviour of gases can be considered fully elucidated, and to the thoughtful worker these still unoccupied regions will probably be the most attractive. While this book has been waiting notice on the reviewer's table, frequent reference has been made to it for work that has appeared since the issue of the first edition, and in no case in vain. It maintains in an enhanced degree its good qualities as a work of reference none engaged in the subject can be

without, and as an authoritative exposition of a field of work the author has made his own it has its own place among a wide circle of readers.

*The New Physics and Chemistry: a Series of Popular Essays on Physical and Chemical Subjects.* By W. A. Shenstone, F.R.S. Pp. vii+360. (London: Smith, Elder and Co., 1906.) Price 7s. 6d. net.

WHEN a collection of essays upon the chief problems in physical science engaging the attention of investigators at the present time is published without an index, its value to students of scientific progress is greatly diminished. Mr. Shenstone evidently does not intend the book to be used for reference, otherwise he would have provided a key to its contents. His essays, which originally appeared in the *Cornhill Magazine*, represent popular science at its best, and rehearse the outstanding features of the new physics and chemistry in a style easy of comprehension. The book should serve a useful purpose in revealing to readers familiar with the concepts of physical science the richness of fact and theory relating to the properties and constitution of matter and the ether.

*The Manufacture of Light.* By Prof. Silvanus P. Thompson, F.R.S. Pp. vi+67. (London: Macmillan and Co., Ltd., 1906.) Price 1s. net.

PROF. THOMPSON'S evening lecture delivered at the York meeting of the British Association in August last is here presented in an attractive form. Twenty-eight clearly reproduced illustrations assist greatly in a thorough comprehension of the discourse. After a brief description of primitive sources of light and a reference to the inventions of gas and electric lighting, the general question of incandescence is discussed. This is followed by an account of photometry and an explanation of the inequality in different directions of the light from various sources. After dealing with the sensitiveness of the eye to radiations of particular wave-lengths, the measurement of emission, and the temperature and quality of radiation, Prof. Thompson describes various incandescent gas-lights, new kinds of glow-lamps and arc-lamps, and concludes with a consideration of the cost of the manufacture of light. The little book should have a wide popularity.

*Lichtstrahlung und Beleuchtung.* By Paul Högnér. Pp. ix+66; illustrated. No. 8 of Dr. G. Benischke's "Elektrotechnik in Einzel-Darstellungen." (Brunswick: Vieweg and Son, 1906.) Price 3 marks.

THIS book gives a clear exposition of illumination by means of electric arc lamps. The theory of the subject is well set forth, and starts from a sufficiently elementary foundation to be easily followed by the average student. The chief feature of the work is a number of tables giving data concerning illumination under different conditions, and these might be profitably consulted by those wishing to arrive at the best results in a given case. The book is well printed and the diagrams are good.

*A Synonymic Catalogue of Orthoptera.* Vol. ii., Orthoptera Saltatoria, Part i. (Achetidæ et Phasgonuridæ). By W. F. Kirby. (London: Printed by Order of the Trustees of the British Museum, 1906.) Price 15s.

THIS volume is the continuation of Mr. Kirby's synonymic catalogue the first part of which was published in November, 1904. The present work includes the Achetidæ, or crickets, and the Phasgonuridæ, or long-horned grasshoppers, often improperly called Locustidæ. The true Locustidæ, or short-horned grasshoppers—often called Acrididæ—will form the third and concluding volume of this work.